

138482-2

IN THE SPECIFICATION

Please substitute the following paragraph for the paragraph on page 3, lines 11-19.

A method is known for producing CHP by oxidation of cumene by air at a high temperature. The oxidation reaction is conducted in the presence of ammonium salts of organic acids or carbonic acid; 0.05- 50% aqueous solutions of the ~~said-salts~~ are used. The ~~said-method~~ (USSR Author's Certificate No. 567723, published on Sep. 9, 1977 in Bulletin of Inventions No. 29) has the following disadvantages, which ~~are we will first discuss with examples~~ using ammonium salts of organic acids ~~as examples~~. Under high- temperature (80-120° C.) conditions of the cumene oxidation process, partial thermal decomposition of the salts occurs by the following reaction:

Please substitute the following paragraph for the paragraph on page 4, lines 6-8.

If ammonium carbonate, an ammonium salt of carbonic acid, is used, then under high-temperature conditions, decomposition of the ~~said-salt~~ occurs according to the following reaction mechanisms:

Please substitute the following paragraph for the paragraph on page 5, lines 5-10.

Furthermore, the ~~said-salts~~ are practically insoluble in organic phases while the volume of the organic phase represents the larger part of the solution. That is why the salts clog the pipelines and precipitate on the walls of heat-exchanging equipment, which leads to reduced heat transfer coefficients. This circumstance especially impairs the process of CHP rectification/concentration that follows the cumene oxidation step.

Please substitute the following paragraph for the paragraph on page 6, lines 1-22.

The ~~said-process~~ has the following primary disadvantage: in feeding gaseous ammonia into the reactor, most of the ammonia escapes into the atmosphere. All existing CHP synthesis plants are equipped with waste-gas afterburning units (thermal afterburning units are used more often than the catalytic ones). This, in turn, leads to the presence of nitrogen oxides in the gaseous emissions and has a negative environmental impact. Furthermore, the patent's high conversion and selectivity characteristics are achieved at a very low cumene oxidation rate (0.6%

138482-2

cumene per hour). In its technical essence, the closest prototype of the proposed method is a process for producing cumene hydroperoxide by oxidation of cumene in an aqueous/alkaline emulsion at a temperature of 92-107.2° C. and a gage pressure of 5 atm in a horizontal cascade of reactors (no fewer than two) in two steps: cumene sequentially passes the first-step and second-step reactors into each of which the oxidant (air) is fed. In order to neutralize the acids, an aqueous solution of sodium carbonate is fed into the second step of the process; in the course of neutralization, sodium carbonate is transformed into sodium bicarbonate. The aqueous salt solution from the second step of the process is treated by ammonia or ammonium hydroxide up to pH=10.5-11.5; in the course of that process, sodium bicarbonate is transformed into the mixed salt,  $\text{NH}_4\text{NaCO}_3$ . The neutralized solution is fed into the first-step reactors in a ratio of (3.5-2.6):1 to the cumene that is fed for oxidation [U.S. Pat. No. 5,767,322, 1998: prototype].

Please insert the following paragraph having a section heading entitled "BRIEF DESCRIPTION OF THE DRAWING" on page 8, after line 9 and before the heading "DETAILED DESCRIPTION".

BRIEF DESCRIPTION OF THE DRAWING

Figure 1 is a schematic illustration of an apparatus employed in a cumene oxidation method of producing cumene hydroperoxide.

Please substitute the following paragraph for the paragraph beginning on line 10 of page 8 and ending on line 2 of page 9.

The process of continuous aqueous-emulsion oxidation of cumene is preferably conducted in a cascade of flow-through reactors by bubbling air through a water-cumene emulsion. The process is conducted at a temperature of 120° C. in the first reactor, lowering it to 80° C. in the last reactor, and at a gage pressure of 5 atm, in the presence of a mixture consisting of a 0.007-0.5% aqueous solution of ammonia and a 0.001-0.5 mass % solution of an ammonium salt (ammonium bicarbonate, ammonium carbonate, ammonium carbamate or a mixture thereof). The ammonia: ammonium salt mass ratio is (1:100): (100:1), preferably (1:10): (10:1). The oxidative feedstock is fed into the bottom part of each reactor while the aqueous phase is fed into the top part of each reactor. The organic layer of the reaction mass gravity overflows into a

138482-2

vessel, from which it is periodically discharged. The aqueous phase is periodically discharged from the bottom of the reactor and flows through valves into a vessel. The gaseous phase is partially condensed in a cooler, passes an activated-coal filter, where partial sorption of cumene takes place, and then goes, through control valves, into an oxygen analyzer and rheometer. The discharge rates of the liquid phases are controlled by pumps. The reactor temperature is set by a thermostat (oil is used as a heat ~~heat~~-carrying agent) and measured by a thermocouple.